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Lock Apparatus for Locking Coupling Plug of Hose Coupling

Patentee: Maschinenfabrik Ewald Wiemann
4630 bochum, Roberstra. 44

Inventor: Paul Triquart, 4630 Bochum

The present invention relates to a locking apparatus for locking a coupling plug of a hose coupling used particularly for a high-pressure hose. The locking apparatus comprises a rotatable ball having a through-hole and located in a casing. The ball is intended to allow connection members to be first connected together at an angle and then pivoted to an operating position where they are linear. The coupling plug, having a flange, is insertable into the ball and fitted in a depression inside the ball, and the coupling plug is guided by the depression of the casing in the connected state.

A hose coupling wherein two ball valves are combined and

Applicants: Toshio Mikiya et al.
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the spherical plugs of the ball valves engage with each other, is known in the art. For connection, one of the valves is engaged with the link shaft of the other, and is then raised. When the spherical plug has been rotated to a flow position by means of a removable cock wrench, a coupling hook is locked simultaneously.

An object of the present invention is to lock a hose coupling in which leakage or a pressure loss in the total pipe pressure does not occur and which enables connection and separation with no need to use a tool.

To achieve the above object, the present invention is provided with a safety sleeve located in the neighborhood of the insertion end of a coupling plug. The safety sleeve is movable against the force of a spring. The safety sleeve has a heel portion at the front end thereof. After being pivoted, the heel portion is fitted in a depression of the top portion of the casing. The depression covers more than one half of the circumference of the heel portion.

The insertion end described above is screwed to the hose coupling and is hermetically sealed. A spring is provided inside the safety sleeve. One end of this spring is in contact with the inner shoulder of the safety sleeve, and the other end is in contact with the inner end of the hose coupling screwed

to the insertion end. The spring force of the spring inside the safety sleeve can be adjusted by turning the screw. The present embodiment enables easy insertion and removal of the insertion end, and this is advantageous particularly in a dimly lit place, such as an underground mining place.

An embodiment of the present invention is illustrated in the drawings.

FIG. 1 is a longitudinal section showing a state where members to be coupled form an angle and the fluid path is therefore closed.

FIG. 2 is a longitudinal section showing a state where a coupling member has been pivoted into a linear state and the fluid path is therefore open.

In these Figures, reference numeral 1 denotes a connection member having a supply passage 1' and being in contact with a supply hose. The connection member 1 is connected to a coupling plug 2 coupled to a device in use. The connection member 1 contains a ball 3, and this ball 3 has three through-holes of different main diameters. Of the three through-holes, the one having the smallest diameter serves as a fluid passage opening 4, the one having the intermediate diameter 5 is used for receiving an insertion end 12, and the one having the largest diameter 6 is used for receiving a

flange 11 provided on the insertion end 12.

The ball 3 is received on a plastic bed 15, which in turn is received on a holder 9. The holder 9 is elastically supported; it is supported by means of a spring 19, for example. The ball 3 is housed in a casing 7 together with the bed 15 and the holder 9. The casing 7 has an elongated opening 8. At the bent portion of the casing 7, the opening 8 has size substantially equal to the diameter 6 of the flange 11 of the coupling plug 2. At the other portions, the casing 7 has an inwardly projected portion. When the coupling plug 2 is pivoted into a linear state, the flange 11 of the insertion end 12 slides on the lower portion of the inwardly projected portion of the casing 2. A safety sleeve 21 having a spring 24 is provided around the insertion end 12. The safety sleeve 21 has a heel portion 21' at the front end, which comes into engagement with a depression 22 after a pivotal movement. The depression 22 covers more than one half of the circumference of the heel portion 21'. With this structure, the coupling plug 2 cannot be pivoted without being raised against the spring force. Hence, unintended disconnection is prevented. In addition, a protrusion 23 is located close to the lower end of the safety sleeve 21. Mounted on the upper edge of the casing 7, the protrusion 23 permits the safety sleeve 21 to be held high at

the pivoted position, i.e., the position where a safety device is disengaged. The protrusion 23 is located within the elongated opening 8 when the hose coupling is connected and the safety device is engaged.

What is claimed is:

1. A locking apparatus for locking a coupling plug of a hose coupling used particularly for a high-pressure hose, wherein a rotatable ball having a through-hole is provided in a casing so as to allow the connection members to be first connected together at an angle and then pivoted to an operating position where the connection members are linear, the coupling plug, which has a flange, is insertable into the ball and fitted in a depression inside the ball, and is guided by the depression of the casing in a connected state,

characterized in that a safety sleeve (21) is provided around an insertion end (12) of the coupling plug (1), said safety sleeve (21) is movable against a force of a spring (24), said safety sleeve (22) has a heel portion at the end (21') thereof, said heel portion is fitted in a depression of a top portion of the casing (7) after a pivotal movement, and the depression covers more than one half of the circumference of the heel portion.

2. A locking apparatus according to claim 1, wherein a protrusion (23) protrudes downward from the lower end of the safety sleeve (21) and is supported on the upper edge of the casing in a tensed state when the safety sleeve (21) is pivoted.

Publications Considered:

German Patent Specifications No. 806,068 and No. 1,119,069

Swiss Patent Specification No. 253,079

U.K. Patent Specification No. 597,331

U.S. Patent Specifications No. 2,403,620 and No. 2,930,575

Drawings (One Page) Attached